**2.8 – Review – Molecules and Compounds**

1. Identify the following as ionic or covalent, and then write the name or formula of the compound:

a. Ag2O h. CO o. Iodine tribromide

b. BCl3  i. C3H8 p. Potassium chloride

c. B4C j. CaS q. Dinitrogen tetraoxide

d. BaBr2 k. Cu(NO3)2 r. Triphosphorus pentanitride

e. Br2 l. Iron (I) nitrite s. Silicon hexafluoride

f. CCl4 m. Iron (II) oxide t. Zinc chlorate

g. CH4 n. Gallium hydroxide u. Zinc antimonide

1. Draw a Lewis diagram for the following atoms:

a. Oxygen f. Cesium k. Hydrogen

b. Nitrogen g. Helium l. Krypton

c. Magnesium h. Iodine m. Potassium

d. Argon i. Lithium n. Carbon

e. Silicon j. Beryllium o. Astatine

1. For each of the atoms in question 2, predict the charge of the ion that would form.
2. **If applicable**, for each atom in question 2, predict the number of covalent bonds that would form.
3. For each of the following:

* Draw the Lewis structure
* Determine electron group geometry
* Record VSEPR notation
* Determine molecular geometry
* Draw a diagram representation of the molecule

a. Carbon tetrachloride i. BSF q. H2CO

b. BH3 j. HBr r. HCN

c. Silicon disulfide k. C2H5OH (ethanol – tricky) s. H2O

d. C2H2 l. N2F4 t. SiF­4

e. PF3 m. SF6 u. ClO3-

f. N2H2 n. CO v. CH4

g. CH3OH o. PCl5 w. PO4-3

h. NO2-1 p. BCl3 x. C2F2

1. **This one is a challenging question**. Each of the following has **more than one** correct Lewis structure. Identify ALL of them.

a. nitrate ion c. **cyclo**butadiene (C4H4)

b. formate ion (CHO2-) d. ozone (O3)

1. Compare and contrast the properties of ionic, covalent, and metallic compounds. How have each of these compounds been used in the past **for their properties**, and how are they used today (again, **for their properties**)?
2. Briefly outline how van der Waals forces affect properties of compounds.
3. Write the correct chemical formula and name for ALL of the alkanes **and** alkenes from 1 through 10 carbon atoms.
4. Draw the following hydrocarbons:

a. ethane e. pentane i. hexane

b. butane f. 2-hexyne j. 4-octyne

c. 2-butene g. propene k. 3-octene

d. 1-pentene h. decane l. 1-nonyne

1. List 4 things that can affect solubility, and describe how each one affects it in a sentence or two.
2. Explain why water is called “the universal solvent”. Why do we say “water something down”?
3. Explain how something like salt in solution can have an impact on properties and how that impacts everyday life.